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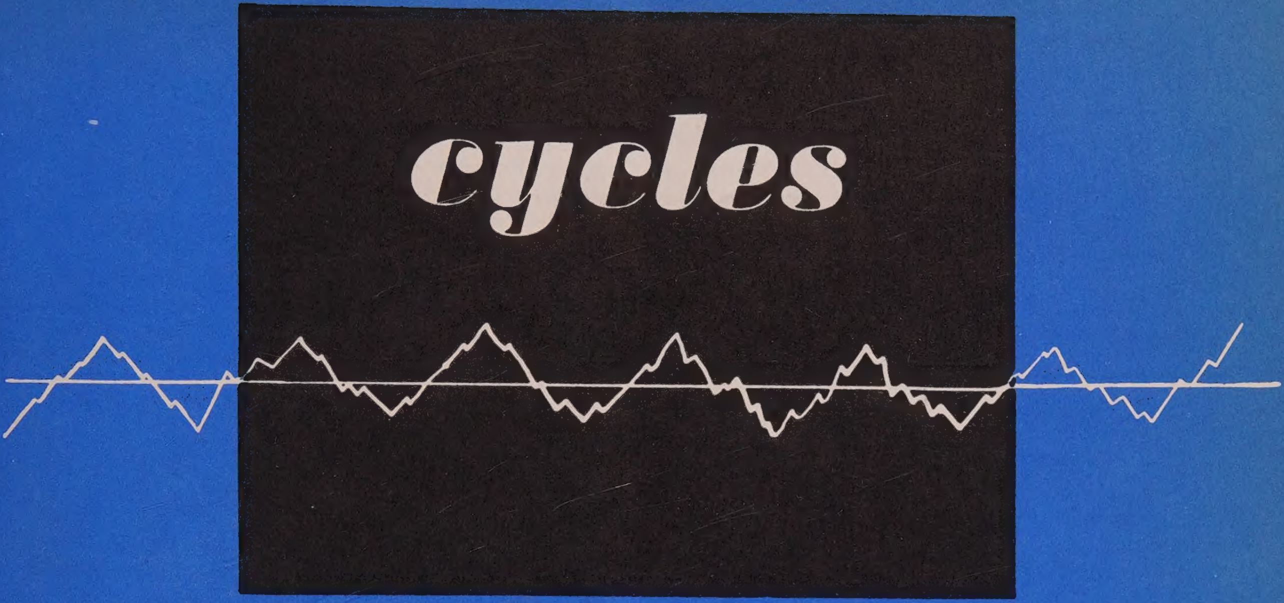

September 1956

FOUNDATION FOR THE STUDY OF CYCLES
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THE DIRECTOR'S LETTER

Dear Member:

A number of years ago there was a cockroach named Archie whose views on this and that appeared from time to time in the daily press.

One day, as Archie was scampering through the holes of a piece of Swiss cheese it occurred to him to wonder what a Swiss cheese would think of, if a Swiss cheese could think.

He turned this matter over in his mind for some time and finally came up with his answer:

What a Swiss Cheese Thinks About

"A Swiss cheese, if it could think, *would think about itself.*" said Archie, "because that is what all the rest of us think about."

Applying this bit of cockroachean wisdom to the present situation I suppose it means that *you* are wondering about the future of the stock market and of general business, and of your own affairs, and that I am wondering how best to foster the new science of cycles.

Non-Cyclic Factors

In regard to the stock market, general business, and your own affairs, a knowledge of cycles is of help, but it is not the whole answer. There are non-cyclic factors too. There is the growth factor. There is inflation. There are random, non-cyclic elements; all these have to be deduced through intelligence or apprehended by intuition. Moreover, as yet, our knowledge of cycles is only partial. However, every little bit helps.

Growth

Let me take a moment to speak of the growth factor present in many series of figures.

For its entire history stock prices have had an upward growth of about 3% a year. This means that, on the average, the down side of stock market cycles are never as bad as the up sides are good.

The same thing is more or less true of industrial production, except that, with industrial production, the rate of growth is not constant. The *rate* of growth—the *percentage* increase from year to year—is getting less every year. This is true for manufacturing production, mineral production, and construction.

Let me speak of manufacturing proproduction. At the present time, in *absolute terms*, manufacturing production is growing faster than it has ever grown before in the entire history of the country. The present great growth of our economy should be a satisfaction and a reassurance to all of us. On the other hand, as I said above, the *rate* of growth is constantly getting less. In manufacturing production it is less than half of what it was forty years ago. At the present time it is about 2% a year, as nearly as I have been able to measure it.

Ten years from now it can reasonably be expected to be about 1½% a year. *This is still very strong.* As with stock prices, it means that, on the average, the ups of the cycles are better than the downs of the cycles are bad.

This growth factor carries us ever higher from peak to peak. For example, *cycle wise* the peak in manufacturing production we enjoyed year-end 1955 was no higher than the peak of mid 1953. But, because of the underlying growth factor that occurred in the 2¼ years between peaks, the actual levels were 5% higher. Growth, though less percentagewise than it used to be, and getting less, percentagewise, all the time, is always there to help out.

Inflation

Inflation is the false increase in prices that results when our government waters our currency. It has of course no direct effect on physical production. However it is an important non-cyclic element that needs to be taken into account in the study of growth trend, in the study of cycles, and in forecasting stock and commodity prices.

Inflation has been temporarily checked. However it has not been permanently renounced. I see no evidence that it will be. It is such an easy way for the government to mulct the public that you should not ignore the possibility that, when convenient, it will again be resorted to.

Recent study of stock market figures convinces me that inflation is the chief reason that actual stock prices, 1943 to 1954, rose so much more than was called for by my stock market cycle projection of 1944.

No one can tell for certain the effect of inflation upon stock market prices, but a fellow can make a stab at it. I plan to do so in the near future. It will help the cycle study considerably.

Cycles

The one thing that I can't seem to get into the noggins of some of our members is the fact that cycles in economic affairs seem to be, at least in part, the result of *natural* environmental forces which affect human beings and thus the economy. As yet no one knows what these forces are, but evidence that they exist is *very* strong.

People say, "You can't have cycles of the same wave length present over long periods of time because business conditions are different now than they used to be." Of course business conditions are different! And if it were business that made the cycles, the cycles would be different too. But the cycles *are the same!* (We've traced one economic cycle back to A.D. 1277. Its length in the 13th, 14th, 15th, and 16th centuries was the same as in the 17th, 18th, 19th, and 20th centuries, as nearly as we have been able to measure it.) This is *proof* that the cycle is not the result of varying economic conditions; it is the result of something *basic*, something *environmental*, something *natural*.

Cycles which continue over six hundred years, cycles which repeat dozens of times, cycles which keep on coming true after discovery, cannot reasonably be the result of chance.

THIS ISSUE

This issue deals largely with the 8½-year cycle and other cycles in the 8- to 9-year range.

The next issue will deal largely with the 8-year cycle, important in many aspects of natural and social science. As you may remember, it is of particular importance in the stock market as a whole, and in the prices of many individual stocks. It is one of the cycles used in my stock market forecast of 1944.

Cordially yours,

Ned Dewey

P. S. I got so busy talking about the things that interest you that I forgot to talk about the things that interest me! I'll do that another time.

THE 9.3- AND 8.6-YEAR CYCLES IN COPPER PRICES

Summary

Copper prices act as if they were influenced by a number of cyclic forces. Two of the most important forces produce cycles 9.3 years long and 8.6 years long respectively. These two cycles are present concurrently in the figures 1784 to date.

This report deals with these two cycles. The 9.3-year cycle is stronger than the 8.6-year cycle and therefore dominates.

Both the 9.3 and the 8.6-year cycles in copper prices have repeated 18 times and have kept on coming true since discovery. They cannot reasonably be the result of chance. They should be taken into account in attempting to evaluate the probabilities of the future.

The combination of these cycles is downward at the present time. Therefore, as far as the 9.3 and 8.6-year cycles are concerned, no further increase in the price of copper is to be expected.

THERE are many cycles present in copper prices, but so far you know about only two of them--the one that is 9.3 years long and the one that is 8.6 years long.

You know that these two cycles are present in these figures because I told you so in *Cycles* for December 1954. (Also, in *Cycles* for March of 1956 I went so far as to show you a chart of the 9.3-year cycle in copper prices all by itself.)

The time has now come to make you a full report of these two cycles. Such a report will show you a chart of the actual copper prices themselves; it will show you the 9.3-year cycle by itself; it will show you the 8.6-year cycle by itself; it will show you these two cycles in combination. It will also show you how these two cycles have unfolded since discovery and what light the existence of these two cycles throws upon the future of copper prices.

For those who want results first off I will summarize as follows:

The 9.3-Year Cycle

Length, as nearly as I have been able to measure it, is 9.28 years. This rounds to 9.3.

Strength, on the average, 14.3% above trend at ideal time of crest, 12.5% below trend at ideal time of trough. This adds up to an overall move of 26.8% of trend in each half cycle (4.65 years). A move of this sort amounts to an average of 5.8% of trend per year.

Timing, of crests comes typically at 1789.0 and every 9.28 years thereafter. This puts the current ideal crest of this cycle at 1956.04 (January 1st 1956) and the next ideal trough of this cycle at 1960.68 (August 1960).

It should be explained that the crest and trough of the ideal *cycle* is not the crest and trough of actual *prices*. As you know, the seasonal cycle of temperature troughs February 1, but the coldest day of any one year may come anywhere from sometime in December to sometime in March.

The 8.6-Year Cycle

Length, as nearly as I have been able to measure it, is 8.60 years.

Strength, on the average, 11.9% above trend at ideal time of crest, 10.7% below trend at ideal time of trough. This adds up to an overall move of 22.6% of trend in each half cycle (4.3 years), or an average of 5.2% of trend per year.

Timing of crests come typically at 1787.55 and every 8.6 years thereafter. This puts the last crest of this cycle at 1950.95, the last trough of this cycle at 1955.25 (February 1955) and the next crest of this cycle at 1959.55 (July 1959).

The Two Cycles Combined

At the present time the 9.3-year cycle is on its way *down;* the 8.6-year cycle is on its way *up.* They thus partly neutralize each other; but, as the 9.3-year cycle is the stronger, it will prevail unless other cycles or randoms enter the picture to the contrary.

A chart which is printed in the 1956 Postscript to *Cycles--The Science of Prediction* on page 254 of this issue shows the actual quarterly average prices of copper, first quarter 1950 through first quarter 1956. This chart also shows a diagram (first quarter 1950 through fourth quarter 1961) of the combination of the 9.3-year cycle, the 8.6-year cycle, and the current underlying trend. The projection of the trend assumes no further inflation (this is a risky assumption, politicians being what they are!)

As you can see, no further increase in the price of copper is to be expected as a result of the two cycles and the trend in combination, but of course this does not mean that other cycles and/or random forces may not combine to push prices higher temporarily.

Now for the Story

Curve A in Fig. 1 on pages 244 and 245 shows copper prices by years from 1784 through 1955. These are prices in currency. No adjustments have been made for abandonment of the gold standard during the Civil War and during recent years.

The broken line, Curve B, represents a 13-year moving average trend. Such a trend changes direction slowly and gives you a better picture of the underlying structure of price behavior.

Underlying Trend Downward

Except for the rise of the last 20 odd years, due in large part to the watering of our currency by the powers that were, the basic underlying (secular) trend of copper prices over the entire period has been downward. You can see this fact more easily if you place a ruler edgewise upon the curve. Better yet, place flat on top of the curve one of the transparent rulers that you can get at any 10¢ store.

The basic underlying growth trend of copper prices is a subject in itself. It will be treated as a separate story in a subsequent report.

Long Cycles in Copper Prices

The placing of a ruler on this chart also emphasizes the fact that copper prices, like prices in general, have been characterized by major oscillations of some 50 to 60 years in length. This is true even if we disregard the War of 1812 peak in 1814, the Civil War peak in 1864, and the World War peak in 1916-17. This long term cycle in copper prices also deserves an article of its own. Such an article will appear eventually.

Shorter Cycles

For our present story however we are interested in the short term fluctuations only, particularly those about 8 or 9 years long. These can be seen more easily if we compute for each year the percentage by which the value for that year is above or below trend. These computations have been made and are plotted as Curve C.

The 9.3-Year Cycle

Simple inspection of Curve C shows a series of oscillations marching across the page at about 9-year intervals. When these oscillations are studied carefully it becomes apparent that a perfectly regular wave of 9.3 years in length fits the ups and downs better than any other perfectly regular wave that can be drawn.

This 9.3-year wave has been diagrammed by means of a broken line labeled Curve D. Curve D helps you to see how very regular the 9.3-year cycle has been. Curve D also helps you so see the extent to which the 9.3-year cycle has been *irregular.* The irregularities are even more important than the regularities.

Curves C and D are substantially the same as the curves in the charts I printed for you on pages 92, 93, 94, and 95 of *Cycles* for March 1956. The differences between the two charts are as follows.

First, the March chart showed quarterly figures whereas Curve C shows *annual* figures.

Second, the March chart showed percentages above and below a 10¼-year moving average trend whereas Curve C shows percentages above or below a 13-year moving average trend.

(The use of a 13-year moving average trend for this study has no particular significance. Ordinarily we use for trend a moving average of the length of the cycle being studied, but this procedure is by no means necessary. The 13-year moving average trend had already been computed for another purpose. It was used here because it was conveniently at hand. The length of the moving average has no effect upon the length of the cycle.)

Third, the March chart showed *smoothed* values, Curve C does not. By avoidance of smoothed figures it is possible to bring the percentages above and below trend right up to date.

Eighteen Repetitions

If you will count them, you will note that there are eighteen 9.3-year waves. To imagine that 18 consecutive repetitions of waves as regular as this could occur as a result of chance is almost fantastic. This is especially true when you realize that the 9-year cycle was discovered nearly 100 years ago (in pig iron prices and in other phenomena) *and has kept on coming true ever since discovery.*

How the 9.3-Year Cycle Came Out

You will note that Curve C is extra heavy from 1947 forward. This convention has been adopted to show you how this cycle in these figures has unfolded since it was first observed.

You will note that Curve C is represented by a broken line from 1949 forward. This convention has been adopted to remind you that the trend from 1949 forward has of necessity been estimated. A 13-year moving average cannot be computed for the 6 years at each end of a series of figures. As the trend is estimated, the percentages above or below trend are of course subject to error. The broken line warns you of this fact.

Getting Rid of the 9.3-Year Cycle

If we now adjust the figures charted in Curve C for the effect of a perfectly regular 9.3-year cycle with the characteristics given above we get the figures plotted as Curve E.

This matter of adjusting a curve for a cycle bothers some people. It should not, because the process is exactly the same as adjusting for seasonal variation. Every time you pick up a newspaper or a business magazine you see curves of prices or products "adjusted for seasonal variation." As you know, this phrase means that the person who prepared the chart has filled up the seasonal or 12-month cycle hollows and pulled down the seasonal or 12-month cycle peaks to show you what the figures would have been if there had been no perfectly regular 12-month seasonal cycle.

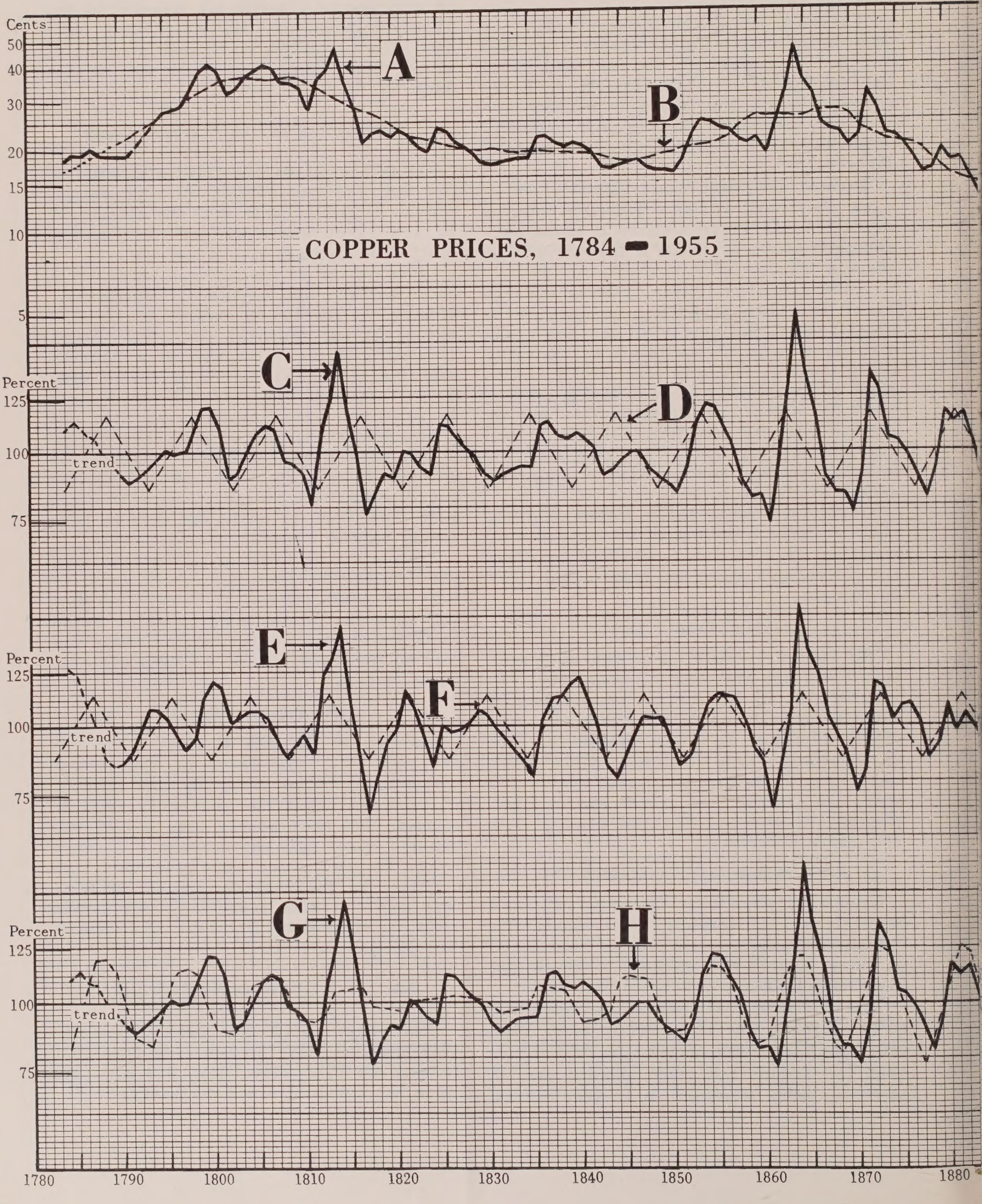
Similarly, in Curve E I have filled up the 9.3-year hollows and pulled down the 9.3-year peaks present in Curve C to show you what the percentages above or below trend would have looked like if there had been no perfectly regular 9.3-year cycle in these figures.

The 8.6-Year Cycle

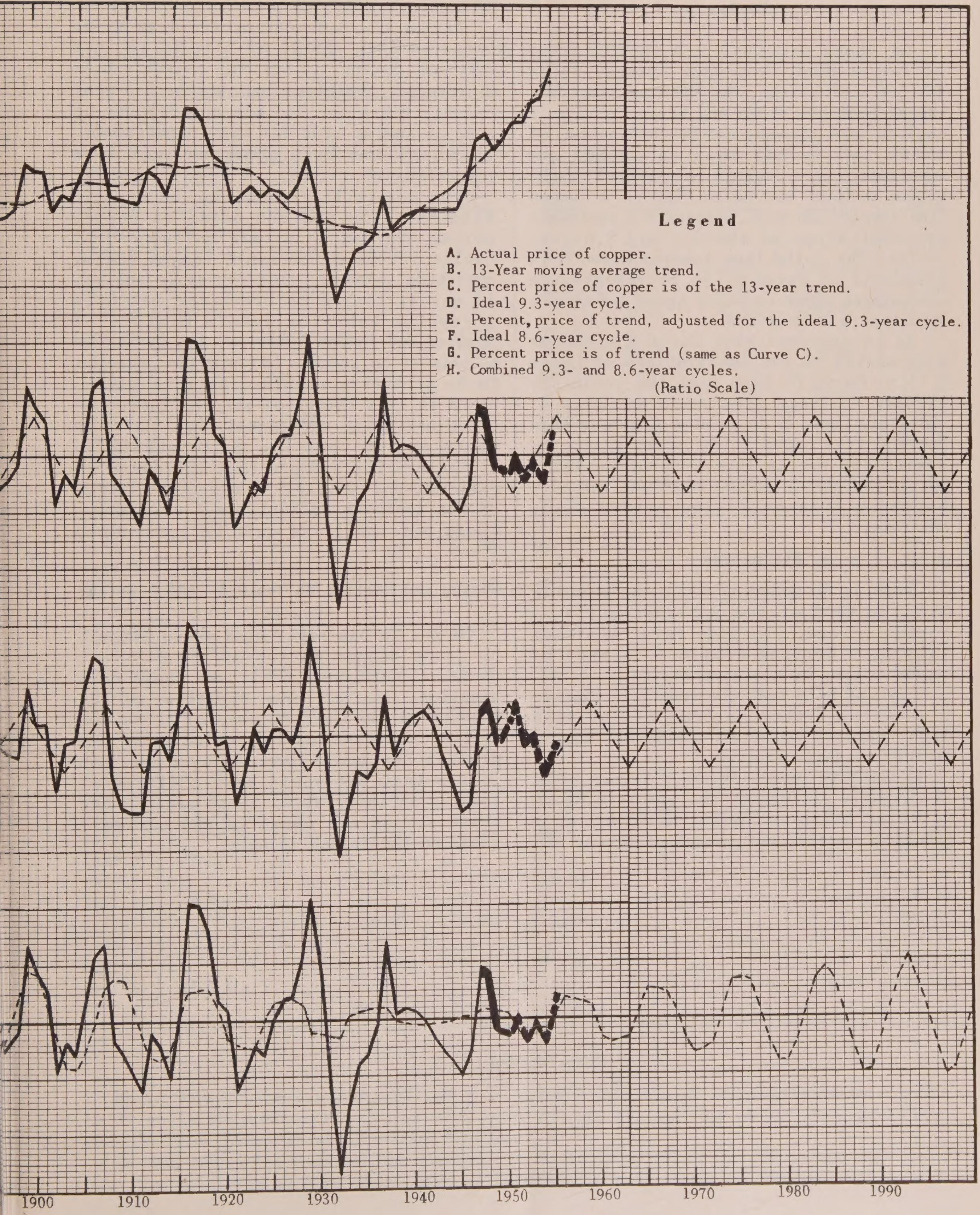
As soon as you look at Curve E you can see that it, like Curve C, fluctuates rhythmically. When you study this rhythm, you discover that the perfectly regular pattern that most nearly fits all of the ups and downs of the curve is 8.6 years long. We therefore conclude that, in addition to the 9.3-year cycle, an 8.6-year cycle is also present. This 8.6-year cycle is diagrammed by means of a broken line labeled Curve F.

How the 8.6-Year Cycle Came Out

The heavy solid line 1947 forward to 1949 and the heavy broken line from 1949 forward to 1955 shows how this 8.6-year cycle has unfolded since discovery.



COPPER PRICES, 1784 — 1955



Legend

- **A.** Actual price of copper.
- **B.** 13-Year moving average trend.
- **C.** Percent price of copper is of the 13-year trend.
- **D.** Ideal 9.3-year cycle.
- **E.** Percent, price of trend, adjusted for the ideal 9.3-year cycle.
- **F.** Ideal 8.6-year cycle.
- **G.** Percent price is of trend (same as Curve C).
- **H.** Combined 9.3- and 8.6-year cycles.

(Ratio Scale)

The Combination of the 9.3- and 8.6-Year Cycles

As there are both 9.3 and 8.6-year cycles present in copper prices, it is obvious that prices, and more particularly the percentages above and below trend will conform more closely to the combination of these two cycles than to either one separately. This fact is illustrated in the bottom pair of curves in Fig. 1. A broken line labeled Curve H represents a synthesis or combination of the 9.3 and 8.6-year cycles. The solid line labeled Curve G is identical to Curve C. It represents the percentages above or below trend before any adjustments whatsoever.

It is apparent that Curve H conforms more nearly to the oscillations of Curve G (i.e. Curve C) than does the perfectly regular 9.3-year diagrammed as Curve D. Similarly Curve H fits Curve G better than Curve F fits Curve E. In other words, by taking *two* cycles into account we get a better representation of what has actually happened than by taking either cycle separately.

Evaluation

There is no question about the probable significance of the 9.3-year cycle in copper prices. The odds favor its continuation barring complete control of copper prices by the government.

I do not hold that the length is exactly 9.3-years. Better methods of analysis might show it to be very slightly longer or very slightly shorter.

If the true length of the 9.3-year cycle is slightly different, the true timing is slightly different also. However, as a practical matter, any change of timing due to any possible revision of length would be unimportant.

As for the 8.6-year cycle, I am by no means so sure. First of all, it is less dominant. Second, it has only recently been discovered. Therefore, unlike the 9.3-year cycle, it has not had the opportunity to keep on coming true for many repetitions. Third, it has been observed much less generally.

The possibility must also be kept in mind that the ups and downs of copper prices are due to or are influenced by cyclic forces of variable length and/or amplitude. Remember that the cycle analyst is merely trying to break the patently irregular behavior into a mixture of regular and random behavior. Its *harder* to do this if he assumes his regular behavior to be *perfectly* regular. As it's harder there is less chance of the regularity he discovers being accidental. But the true facts may be that the cycle itself is irregular—for example that the cycle is gradually and regularly changing its length or its strength or both. As I said above these possibilities must be considered also.

Buying and Selling on the 9.3- and 8.6-Year Cycles

No one in his right mind would attempt to trade copper on either the 9.3-year cycle, the 8.6-year cycle, or their combination. However, some appraisal of the importance and the dominance of these two cycles can be obtained by calculating the profits one would have enjoyed and the lossss that one would have suffered by trading on this basis. These profits and these losses are shown in the buy-sell table on the following page.

COPPER

A Buy-Sell Table Based on the Combination of the 9.3- and 8.6-Year Cycles

(Prices in Cents Per Pound)

Date Year & Quarter	Long				Short				Cumulative Profit or Loss
	Price		Profit or Loss Cents Per Pound	Profit or Loss %	Price		Profit or Loss Cents Per Pound	Profit or Loss %	
	Buy	Sell			Short	Cover			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1784-2	18.90								
1788-2		19.69	0.79	4.18	19.69				4.18
1793-2	22.84					22.84	-3.15	-16.00	-11.82
1798-1		26.77	3.93	17.21	26.77				5.39
1802-3	36.22					36.22	-9.45	-35.30	-29.91
1807-2		40.16	3.94	10.88	40.16				-19.03
1811-4	28.35					28.35	11.81	29.41	10.38
1816-3		29.13	0.78	2.75	29.13				13.13
1821-2	22.05					22.05	7.08	24.30	37.43
1826-2		23.62	1.57	7.12	23.62				44.55
1831-4	18.11					18.11	5.51	23.33	67.88
1835-3		18.90	0.79	4.36	18.90				72.24
1840-1	21.62					21.62	-2.72	-14.39	57.85
1844-4		16.54	-5.08	-23.50	16.54				34.35
1849-2	17.32					17.32	-0.78	-4.72	29.63
1854-1		25.20	7.88	45.50	25.20				75.13
1858-4	20.47					20.47	4.73	18.77	93.90
1863-2		29.74	9.27	45.29	29.74				139.19
1867-4	22.96					22.96	6.78	22.80	161.99
1872-3		32.64	9.68	42.16	32.64				204.15
1877-1	18.87					18.87	13.77	42.19	246.34
1881-4		18.42	-0.45	-2.38	18.42				243.96
1886-2	10.42					10.42	8.00	43.43	287.39
1890-4		16.21	5.79	55.57	16.21				342.96
1895-2	10.95					10.95	5.26	32.45	375.41
1900-1		15.88	4.93	45.02	15.88				420.43
1904-4	12.62					12.62	3.26	20.53	440.96
1909-1		13.08	0.46	3.65	13.08				444.61
1914-2	13.94					13.94	-0.86	-6.57	438.04
1918-4		26.00	12.06	86.51	26.00				524.55
1923-3	13.82					13.82	12.18	46.85	571.40
1928-1		13.84	0.02	0.14	13.84				571.54
1932-3	5.42					5.42	8.42	60.84	632.38
1937-1		13.87	8.45	155.90	13.87				788.28
1942-2	11.78					11.78	2.09	15.07	803.35
1947-2		21.56	9.78	83.02	21.56				886.37
1951-2	24.20					24.20	-2.64	-12.24	874.13
1956-1		45.02	20.82	86.03	45.02				960.16

EXPLANATIONS

Note: Because the synthesis of the 9.3- and 8.6-year cycles was available on a quarterly basis the quarterly figures were used to time the turning points more precisely than would be possible using annual figures.

In most cases the high or low quarter occurs in the high or low year, but occasionally the quarterly turning point comes slightly before or after the average yearly high or low.

Explanations Continued

Column 1. Dates (year and quarter) when the combined influences of the ideal 9.3- and 8.6-year cycles in copper prices were (a) at their lowest or (b) at their highest.

Columns 2, 3, 6, and 7. Prices are in cents per pound, determined according to the method set forth in the notes to the copper price table which follows.

Column 2. Buy. The average prices for the years and quarters indicated on the same line of Column 1. These are the prices at which you would have bought.

Column 3. Sell. The average prices for the quarters indicated on the same line of Column 1. These are the prices at which you would have sold.

Column 4. Actual Long Profit. The selling prices (Column 3) minus the buying prices (the figures on the lines above in Column 2). Losses are shown (-).

Column 5. Percent Long Profit. The percentages that the long profits (Column 4) are above or below the prices at which you would have bought (Column 2). Losses are shown (-).

Column 6. Short. The average prices for the quarters indicated on the same line of Column 1. These are the prices at which you would have gone short. They are the same as the prices at which you would have sold for the previous transaction (Column 3).

Column 7. Cover. The average prices for the quarter indicated on the same line in Column 1. These are the prices at which you would have covered. They are the same as the prices at which you would have bought for the next transaction (Column 2).

Column 8. Actual Short Profit. The covering prices (Column 7) minus the prices at which you would have gone short (the figures on the line above in Column 6). Losses are shown (-).

Column 9. Percent Short Profit. The percentages that the short profits (Column 8) are of the prices at which you would have gone short (Column 6). Losses are shown (-).

Column 10. Cumulative Profit. All the long and short profits (or losses) added together, one by one, cumulatively. Losses are shown (-).

Buy-Sell Summary

As you can see from the Buy-Sell table above, trading in copper on the basis of the 9.3- and 8.6-year cycles would have resulted in 37 transactions and an overall profit of 960.15% for the entire period, 1784-1956. Of the 37 transactions, 19 would have been on the long side, 18 on the short.

Of the 19 long transactions, 17 would have been profitable, 2 unprofitable. The 17 profitable long transactions would have averaged 40.90% gain each. The 2 unprofitable long transactions would have averaged a loss of 12.94% each.

Of the 18 short transactions, 12 would have been profitable, 6 would have been unprofitable. The 12 profitable short transactions would have averaged 31.66% gain each. The 6 unprofitable short transactions would have averaged a loss of 14.87% each.

On the average, *all* 19 long transactions showed a profit of 35.23% per transaction; *all* 18 short transactions showed a profit of 16.15% per transaction.

On the average, *all* 29 profitable transactions showed a profit of 37.08% per transaction; all 8 unprofitable transactions showed a loss of 14.39% per transaction.

The Buy-Sell table is not introduced into this story to suggest that you should trade copper on the basis of these two cycles alone. Quite the contrary. I have already said that no prudent man would do so. The Buy-Sell table is merely introduced (1) to show you that the 9.3- and 8.6-year cycles do not depend upon any manipulation of the figures; (2) to show you that, in that actual figures, they are *consistently* present; and (3) to show you that, in the actual figures, these cycles prevail over all other cycles and randoms in combination, 29 times out of 37—about 4 times out of 5. They need to be taken into account as *background* information and modified by such other information in regard to the probable future course of copper prices as you may be fortunate enough to possess. *E.R.D.*

COPPER PRICES, 1784—1955 —AN INDEX

All prices in cents per pound.

Year	Price	Year	Price	Year	Price	Year	Price	Year	Price	Year	Price
1784	18.50	1814	47.24	1844	17.13	1874	22.75	1904	12.82	1934	8.43
1785	19.88	1815	35.24	1845	17.52	1875	22.08	1905	15.70	1935	8.65
1786	19.69	1816	28.74	1846	17.91	1876	20.52	1806	19.28	1936	9.47
1787	20.28	1817	21.46	1847	18.11	1877	18.22	1907	20.00	1937	13.17
1788	19.69	1818	23.03	1848	17.13	1878	16.08	1908	13.21	1938	10.00
1789	19.69	1819	23.82	1849	16.73	1879	16.82	1909	12.98	1939	10.97
1790	19.69	1820	22.44	1850	16.73	1880	19.77	1910	12.74	1940	11.34
1791	19.69	1821	23.62	1851	16.54	1881	17.85	1911	12.46	1941	11.80
1792	21.06	1822	22.44	1852	18.50	1882	18.17	1912	16.34	1942	11.78
1793	22.93	1823	20.47	1853	22.83	1883	15.55	1913	15.27	1943	11.78
1794	25.30	1824	19.69	1854	25.20	1884	13.57	1914	13.35	1944	11.78
1795	27.66	1825	23.82	1855	25.00	1885	10.93	1915	17.28	1945	11.78
1796	28.35	1826	23.23	1856	23.91	1886	10.81	1916	27.19	1946	13.82
1797	29.72	1827	21.46	1857	23.23	1887	11.02	1917	27.18	1947	20.96
1798	34.25	1828	20.28	1858	21.55	1888	16.22	1918	24.74	1948	22.04
1799	39.76	1829	19.49	1859	21.05	1889	13.43	1919	18.46	1949	19.20
1800	41.54	1830	18.11	1860	21.82	1890	15.36	1920	17.46	1950	21.24
1801	39.37	1831	17.72	1861	19.41	1891	12.81	1921	12.50	1951	24.20
1802	32.28	1832	18.11	1862	25.26	1892	11.18	1922	13.38	1952	24.20
1803	33.86	1833	18.31	1863	32.26	1893	10.63	1923	14.42	1953	29.57
1804	37.80	1834	18.50	1864	45.98	1894	9.36	1924	13.02	1954	29.69
1805	39.76	1835	18.50	1865	35.51	1895	10.57	1925	14.04	1955	37.49
1806	40.95	1836	22.05	1866	31.23	1896	10.83	1926	13.80		
1807	39.96	1837	22.24	1867	24.65	1897	11.07	1927	12.92		
1808	35.83	1838	20.87	1868	23.15	1898	11.79	1928	14.57		
1809	35.43	1839	20.56	1869	22.94	1899	17.26	1929	18.11		
1810	33.66	1840	21.05	1870	20.27	1900	16.19	1930	12.98		
1811	27.95	1841	20.47	1871	22.19	1901	16.11	1931	8.12		
1812	36.42	1842	19.49	1872	32.35	1902	11.63	1932	5.56		
1813	39.76	1843	17.13	1873	28.37	1903	13.43	1933	7.03		

Notes and Sources:

Annual figures are the averages of 12 months, except 1914 which is the average of 10 months, and 1918 and 1919 which are averages of 11 months.

Figures beginning in 1900 and to date are the price of electrolytic copper at New York and can be obtained from the following publications.
The Mineral Industry (various issues) 1900—1916
Metal Statistics Yearbook (1926 volume) 1917—1924
Survey of Current Business & Supplements 1925 to date

Prior to 1900 sources, descriptions, and adjustments are as follows:

1860—1899 *The Mineral Industry* (various volumes). Quotations are for New York Lake Copper. From 1899—1910 New York Lake averaged 1.02 times the price of electrolytic. Thus, Lake prices were divided by 1.02 to reduce to an estimated electrolytic price.

1784—1859 A. H. Cole. *Wholesale Prices in the United States 1700—1861 (Statistical Supplement)*, Harvard University Press, 1938. Quotations are for sheets at Philadelphia. Figures for the entire period are reduced to level of New York Lake on an electrolytic basis by use of the factor 0.7874, which was 1860-61 relationship between Philadelphia sheeting price and New York Lake price on electrolytic basis. 1784—1791 prices in shillings converted to cents on basis of 7.5 shillings equals 1 silver dollar. No quotations 1792—1795. A straight line was drawn across the gap.

THE 8½-YEAR CYCLE

IN

COMMON STOCK PRICES

BECAUSE the 8½-year cycle is so strong and clear in copper prices and in pig iron prices from 1784 to date (172 years), it would be reasonable to expect to find it in common stock prices too. For this reason, and because Vedder Hughey found a cycle of this length in these figures as I told you in our report for March 1953, I decided to see what I could find of this general order of magnitude.

I regret to tell you that although there is a weak cycle of this length present *on the average* in stock prices, the evidence assembled to date does not convince me that there is a *repetitive* cycle of this length that can be counted on to continue. I wouldn't be so rash as to say that such a cycle *isn't* there; I merely say I haven't yet been convinced that it *is* there. Until I am convinced I shall not include it in the revised synthesis I am preparing for you.

In a way, all the money we have spent investigating the 8½-year cycle in stock prices seems futile—a wild goose chase—but this is not really so, It's just as important to know the cycles that are *not* present as to know the ones that *are*. When a chemist analyzes a sample of metal he will test for one element after another. Iron? No. Zinc? Yes. Tin? Yes. Lead? No, and so on. It's just as important to know that lead and iron are absent as to know that zinc and tin are present.

It may be worth while to take a minute to explain the difference between cycles present "on the average" and cycles actually present "repetitively."

Suppose a plumber has ten joints of ½ inch pipe and ten joints of 1½ inch pipe. The average size of his pipe is 1 inch $\left(\frac{\frac{1}{2} + 1\frac{1}{2}}{2}\right)$. Suppose you were to call up and say, "What size pipe do you have?"

"On the average," he answers, "my pipe is 1 inch."

"Fine," you say, "just what I want. Send over a joint of 1 inch."

"Oh," he says, "I haven't any *actual* 1 inch pipe—that's just the *average* size of my pipe."

Another plumber might have ten joints of ½ inch pipe, ten joints of 1 inch pipe, and ten joints of 1½ inch pipe. His average would be 1 inch too, but unlike the first plumber he would have actual 1 inch pipe instead of a meaningless arithmetic figure.

In other words, sometimes the average means something, sometimes it doesn't.

This illustrates in a crude sort of way why, in cycle study, you always need to know, if you can, in addition to the *average* characteristics, whether or not a cycle repeats time after time repetitively. The 8½-year cycle in combined common stock prices does *not* do this visibly in the figures I have so far studied.

This fact, coupled with the fact that, on the average, the 8½-year cycle is very weak, *and* the fact that the tops of the average 8½-year cycle in stock prices come at a different time from the tops of the 8½-year cycle in pig iron and copper prices, are the factors which cause me to reject the 8½-year cycle in stock prices at the present time.

This does not mean that there is not an 8½-year cycle in the prices of *individual* stocks or even in the prices of *groups* of stocks. This is a subject for separate future study.

E.R.D.

THE 1956 POSTSCRIPT TO CYCLES—THE SCIENCE OF PREDICTION

PART VIII: THE 8- TO 9-YEAR CYCLES

"WELL," said Robert as we resumed our discussion of cycles, "I am glad we are through with the 9-year cycle. It took us a long time to finish that one up."

"It would have taken more," I said, "if I had gone to the files and showed you all the unpublished material I have regarding it. However, I think you've quite enough of that one cycle for now."

"What's the next thing on the docket?" said Robert.

Cycles 8 to 9 Years Long

"Well the most logical thing would be to review the cycles from 8 to 9 years in length. Then next week, we could get into a discussion of the so-called 8-year cycles which are almost as numerous and as important as the 9-year cycle."

"Are there many cycles between 8 years and 9 years long?" asked Robert.

"Several." I said."There is a great deal of evidence of one or more sunspot cycle of this general order of magnitude. Seven different cycles from 8.359 to 8.94 years long have been alleged by one or another of various investigators. The other lengths are 8.4, 8.5, 8.7, 8.76, and 8.8. A cycle 8.85 years has been found in the thickness and thinness of the rings of a pre-glacial tree. A cycle 8.67 years long has been found in European weather. However, the cycle we know most about seems to be about 8½ years long. It has been found in copper prices, in pig iron prices, in cotton prices, in barometric pressure and air temperature at Batavia, and in sunspots as mentioned above."

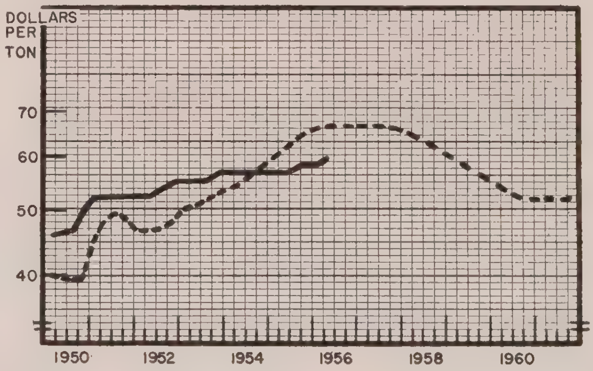
The 8½-Year Cycle Worth Investigating

"Would you call the 8½-year cycle thoroughly substantiated?" asked Robert.

"No." I said. "It is nowhere nearly as well substantiated as either the 8-year cycles or the 9-year cycles, but it has been present over a long enough period of time and in enough different things to suggest that it should be investigated thoroughly."

In Pig Iron Prices

"You speak of this cycle as being pre-

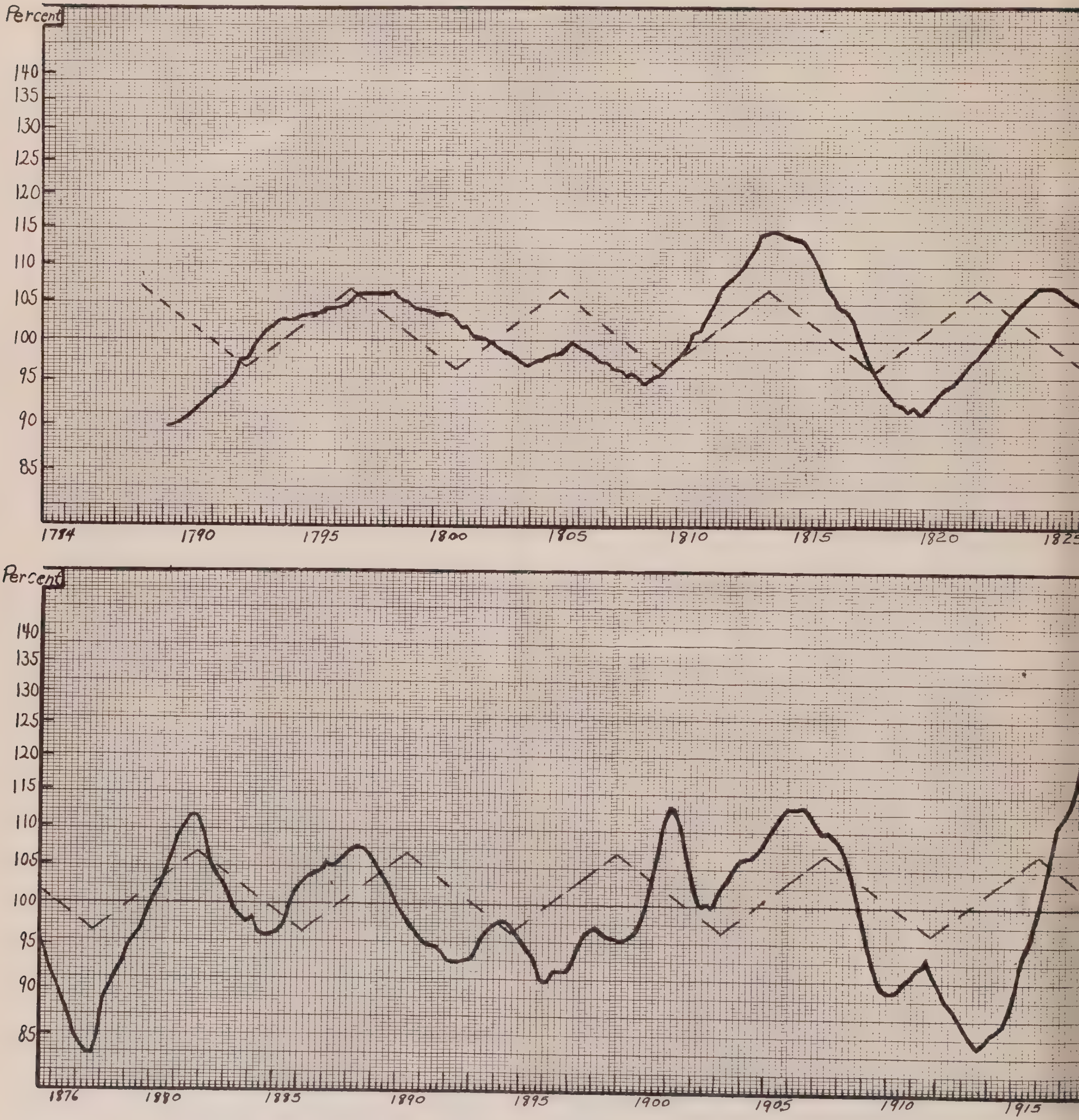


PIG IRON PRICES—THREE CYCLES AND TREND,

1st Quarter 1950—4th Quarter 1961

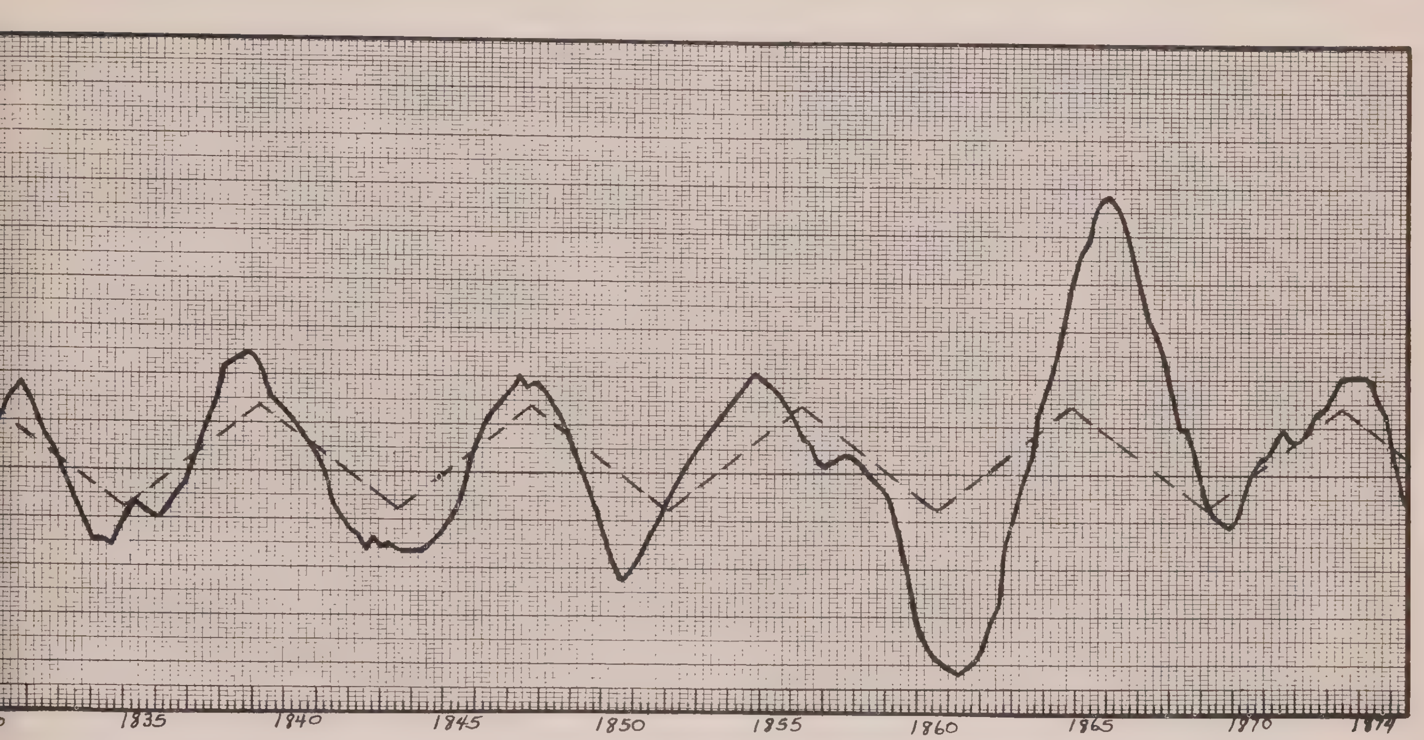
Solid Line: Pig iron prices, by quarters, 1st quarter 1950—2nd quarter 1956.

Broken line: Synthesis of ideal 17 3/4-year, 9.2-year, and 8.5-year cycles, as found in pig iron prices 1784—1955, a preliminary estimate of trend, and the inflation factor. The inflation factor has been projected at its 1953 level.



THE 8.5-CYCLE IN PIG IRON PRICES, 1784--1955

Solid line: Percentages of trend, smoothed, adjusted for the 9.2-year cycle. (The trend was a 10¼-year moving average. The smoothing was accomplished by a 4¼-year moving average.)
The heavy black portion at the end shows how this cycle has unfolded since discovery. The heavy dashed portion represents percentages from an estimated trend.
Dashed line: Diagram of a perfectly regular 8.5-year cycle. (Ratio Scale.)


1835
1840
1845
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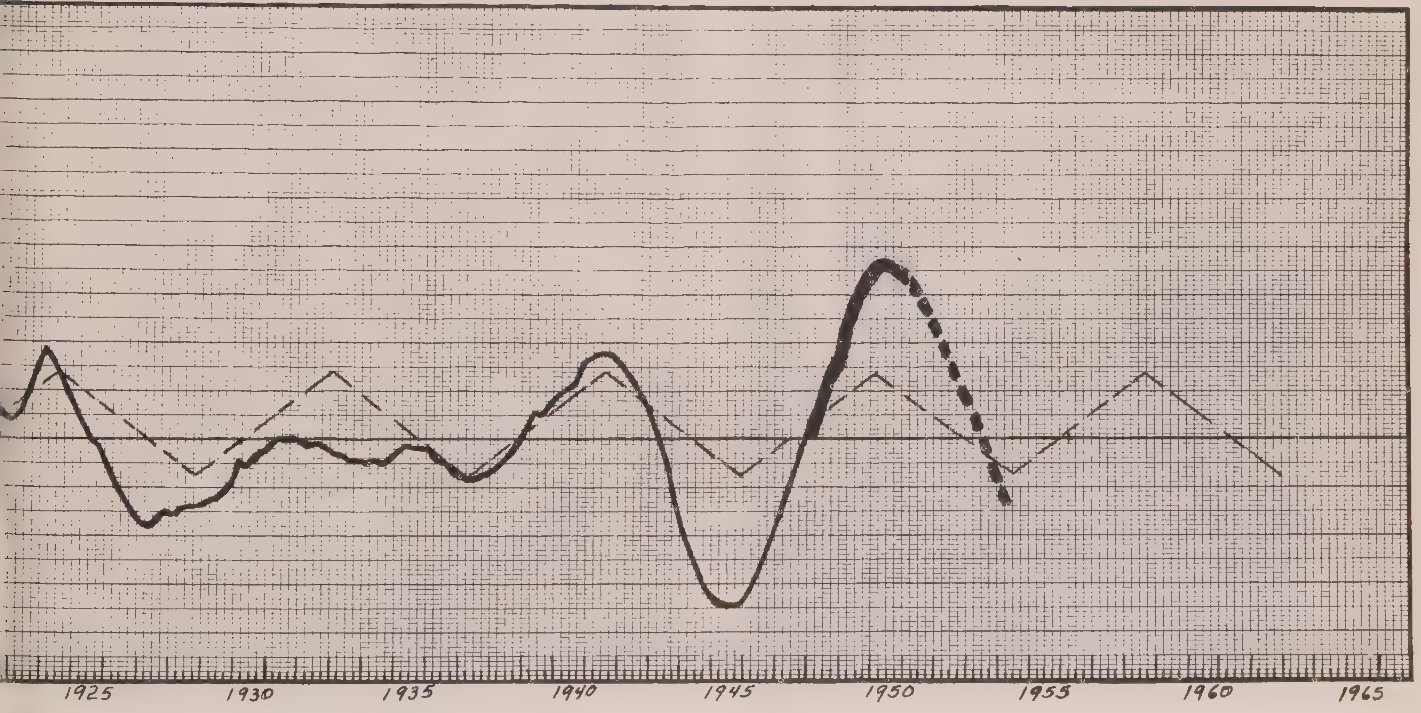
1855
1860
1865
1870
1874


1925
1930
1935
1940
1945
1950
1955
1960
1965

sent in pig iron prices."said Robert.

"Yes," I said, "it has been present continuously as a rhythm in these prices from 1784 to date. Here is a chart of it." [See Fig. 1 on pages 252 and 253 next following]

"It certainly is regular." said Robert.

"Yes," I said. "The crest due in 1788 was missing but from then on the regularity has been noteworthy. As you look at the chart, you see (starting in 1785) and counting low to low, wave, wave, wave, wave, wave, wave, wave, wave, wave, wave, wave, double bottom, wave, wave, wave, wave, wave, wave, wave, right up to date.

"Just what is this chart?" asked Robert.

Chart of Percentages Above and Below Trend

"It is a chart of the percentages by which pig iron prices are above or below trend after the 9.2-year cycle has been removed. The 9.2-year cycle is stronger than the 8.5-year cycle and unless we remove the 9.2-year cycle, the 9.2 would obscure the 8.5. The broken line diagrams the perfectly regular 8.5-year cycle; the heavy line shows how it has come out since discovery."

"How strong is the 8½-year cycle in pig iron prices?" said Robert.

Strength

"It is typically 6.4% above trend at time of crest, 6% below trend at time of trough. Its shape, like that of the 9.2-year cycle, is symmetrical and seems to be zigzag when the average wave is plotted on ratio scale."

"When is this cycle due for its next crest?"

Timing

"As nearly as I have been able to measure it, the next crest of this 8½-year cycle is due ideally between August and September 1958. It is, therefore, going *up* at the present time. The crest of the 8.5-year cycle in pig iron prices comes something after the crest of the 9.2-year cycle. The 9.2-year cycle is stronger and is going *down* at the present time. It will of course prevail. The combined effect of the two cycles suggests that pig iron prices will not go down as rapidly as they would if we had to deal with the 9.2-year cycle alone."

"Do you have a chart of these two cycles in combination? I'd like to get a bit of a preview of what's ahead."

Three Pig Iron Cycles and Trend

"Yes, I do have one, but I'm not going to show it to you because, for your purposes, I have a better one. Here is a chart which shows not only two cycles but a third cycle and trend as well." [See page 251.]

"What is the third cycle?"

"It is one 17 3/4 years long that I reported upon in the Spring 1952 *Journal of Cycle Research*. It is quite strong. It has a typical overall move of 37.1% of trend from crest to trough or vice versa. The next crest of the 17 3/4-year cycle in pig iron prices is due ideally at the end of 1956. It's still going up but not for much longer."

"You spoke of trend."

Trend and Inflation

"Yes, the dotted line in the chart includes trend as well as the 9.2- and 8.5-year cycles. Trend on its part includes inflation from 1950 up to date, but assumes no further inflation for the projection into the future."

"Was that funny bump in 1951 due to the inflation factor?"

"Yes."

"Are there any more cycles in pig iron prices?"

"Yes, many. Several more of them have been isolated, too, but I've not had time to report upon them in print so I did not include them in the synthesis."

"Where else do you find the 8 1/2-year cycle?" asked Robert.

"Copper prices, cotton prices, barometric pressure and temperature at Batavia, and in sunspots."

In Cotton Prices

"When is the crest due in cotton prices?"

"I cannot tell you. Cotton prices have not yet been studied enough to find out. When we analyze cotton prices for cycles of all possible lengths we find definite evidence of strength, on the average, at 8 1/2-year intervals, but that is as far as the work has gone to date. Give me a little time!"

"All right. Copper then."

In Copper Prices

"Copper is funny. The length in copper is 8.6 instead of 8.5 as in pig iron prices."

"That is peculiar." said Robert. "If they get out of step with each other 1/10 of a year a cycle, in ten cycles they would be out of step a year and in 43 cycles they'd be completely upside down in relation to each other. That hardly seems reasonable, does it? Could you have made an error?"

"Every man is entitled to make one mistake in life, and this may be mine, but I don't think so. An 8.6-year pattern does fit all the points on the copper curve better than an 8.5. An 8.5-year pattern does fit all the points on the pig iron curve better than 8.6."

"Then why the discrepancy?"

"Two possible reasons: Perhaps one curve or the other had an undue proportion of randoms that made the ideal cycle look a little longer or a little shorter than it actually is. Perhaps the 8.5--8.6-year cycle is a compound cycle created in one instance (or both) of two closely related cyclic forces, one of which is stronger in one series of figures than in the other. However, we have to take facts as we find them."

"Yes."

The Chart

"But to get on with copper. Here is a chart [See chart on pages 244 and 245.] which shows you the whole copper story. Curve A shows you actual copper prices. Curve B shows a 13-year moving average trend. Curve C shows this trend as a straight 100% line and shows copper prices expressed as percentages above and below this trend. Curve C shows a 9.3-year cycle It is diagrammed by the broken zigzag line D. Curve E shows the values in Curve C adjusted for the average 9.3-year cycle. Curve E shows the 8.6-year cycle. Curve F diagrams it. Curve G is the same as Curve C--that is, it shows percentages above and below trend. Curve H shows the 9.3 and 8.6-year cycles in combination."

"Curves C and D are the same as you showed me before, aren't they, in connection with the 9.3-year cycle?"

"Yes, except the earlier chart [*Cycles* for March 1956, pages 70-73.] used quarterly average figures. This chart uses annual average figures. I think this is a little clearer. At all events, it is a bit more condensed."

How It Came Out

"It's remarkable how the darned thing has worked out since discovery." said Robert. "That's quite an idea of yours to show how it came out by means of a bold line."

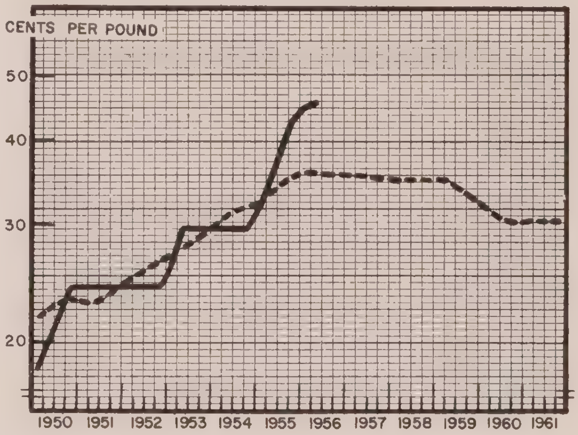
"Pure genius!" I said.

"The 8.6-year cycle in copper looks more regular than the 8.5-year cycle in pig iron prices." said Robert.

"It should." I said. "It's stronger. It has an overall move from high to low or vice versa of 22.6% of trend as against 12.4% of trend for pig iron."

"Does it have the same timing?"

"Not quite." I said. "In copper the next crest comes ideally July 1959 whereas in pig iron it comes ideally between August and September, 1958. The difference is due to the fact that the length assigned to copper is 1/10 of a year longer than the length assigned to pig iron."



COPPER PRICES—TWO CYCLES AND TREND,

1st Quarter 1950--4th Quarter 1961

Solid line: Copper prices, by quarters, 1st quarter 1950—2nd quarter 1956.

Broken line: Synthesis of ideal 9.3 and 8.6-year cycles, as found in copper prices, 1784--1955, and a preliminary estimate of trend. (Ratio Scale.)

"What are copper prices going to do?" asked Robert.

The Copper Synthesis

"Well, *as far as these two cycles and trend are concerned,* assuming no further inflation, my best guess is we are not likely to see further increase in the price of copper." [See chart on page 255.]

The Inflation Factor

"I notice you assume no further inflation. Do you think inflation is over?"

"Definitely not! I see no evidence of enough wisdom on the part of the electorate or enough courage on the part of the government to turn back the tide, or even to hold it at present levels. I'm sure we'll have more inflation, but I have no special skill to judge just when or how much. Therefore, in projections, I assume a continuation of present inflation levels, leaving it to the reader to modify the projection by his own ideas of what the future course of inflation will be. If we keep on the way we've been going I see no alternative to *eventual* complete financial collapse of the sort that overtook France and Germany after World War I. However I think the end of the road is still quite a distance away. Perhaps we will not see it until after the next major war."

Other Copper Cycles

"Have you worked out any other cycles for the price of copper?" asked Robert.

"Yes indeed." I answered. "However I have not had time to report on them. Writing these darn reports takes more time than doing the research! Just as soon as I can I'll write up the other cycles and include them in the synthesis too."

"That will be good." said Robert. "Then we'll have something like your stock market forecast that we can watch from year to year, won't we?"

"Yes." I said.

Natural Science Cycles Same Length

"It's interesting that you have natural science cycles of this same length. For me that adds greatly to its significance. Tell me more."

"I agree with you that natural science examples are very important confirmation. Unfortunately, I can't tell you too much about them. The only information I have on Batavia is a paper by Dr. H. J. de Boer which was written about 1941. In this paper he fails to give the length of the series being studied, but I judge the figures go back to 1866. He does not give the data. I suppose these are published elsewhere. He does however give the length of the cycle as 8.47 years. He seems to feel that it is an 'unreal' cycle created by the interaction of 'real' 3-, 7-, 11-, and 36-year cycles."

"Even if it's 'unreal' it would be 'real' while it lasted, wouldn't it?" asked Robert.

"Yes." I said.

The 8.5-Year Sunspot Cycle

"How about the 8.5-year sunspot cycle?"

"All I can tell you is that it was discovered by A. E. Douglass, an astronomer of Tuscon, Arizona. I don't know the timing, the strength, or the methods used to measure it. A. Shuster discovered a cycle he called 8.4 years long. It is doubtless the same as the one G. T. Lane called 8.359. Dinsmore Alter got one 8.7, G. T. Lane got one 8.76; K. Stumpff made it 8.8 and H. H. Clayton computed 8.94, which is perhaps the one I have called 9.0. Except for Lane's work, which I told you about in the Winter 1954 *Journal of Cycle Research*, I do not know any details of methodology, timing or amplitude."

"Why not."

"Same old answer. Not enough money to hire the help to find out."

Other Cycles

"What else have you?"

"Only those two other cycles I mentioned. The 8.85-year cycle found in the thickness and thinness of a preglacial tree, and the 8.65-year cycle found in European weather."

"Could these be different measurements of the same cycle?" asked Robert.

"I don't know. The references I have are too sketchy to pass judgement. All I know about the 8.85-year cycle is a reference to it by Dr. Ralph de Lury, Astronomer Royal of Canada. He said, 'A pre-glacial tree shows a wonderful 8.85-year cycle. In the case of the tidal influence the cycle was

8.85'."

"What does that mean?"

"I don't know."

A Weather Cycle

"The last of the cycles I mentioned is the 8.67-year European weather cycle. It was discovered by D. Brunt in an elaborate analysis of rainfall, temperature, and atmospheric pressure in twelve European cities where records for at least a century are available. His results are quoted by Ellsworth Huntington in *Mainsprings of Civilization.* I quoted from Huntington in *Cycles* for December 1953. I'm sorry I can't tell you more."

"Yes, it's too bad." said Robert. "It looks to me as if all this 8- to 9-year work ought to be done over so that we could know what these lengths really are and so that we could have comparative tables and charts showing strength, shape, and timing for each length and each cycle just as you have for the 9.0-, 9.3-, and 9.6-year cycles."

"I fully agree with you. Maybe, by the time I write this postscript again we'll have the money with which to do it."

Next Time

"What's up for our next meeting?" asked Robert.

"I plan to devote it to the cycles about 8 years long. They are important in the stock market, in cigarette production, in wheat production, in cotton prices, in barometric production, and in a number of other phenomena. I'll summarize what we know about them, show you how they came out since discovery, and let you see what they suggest for the future.

"Fine!" said Robert.

E.R.D.

THE MODIFIED GEISINGER INDICATOR

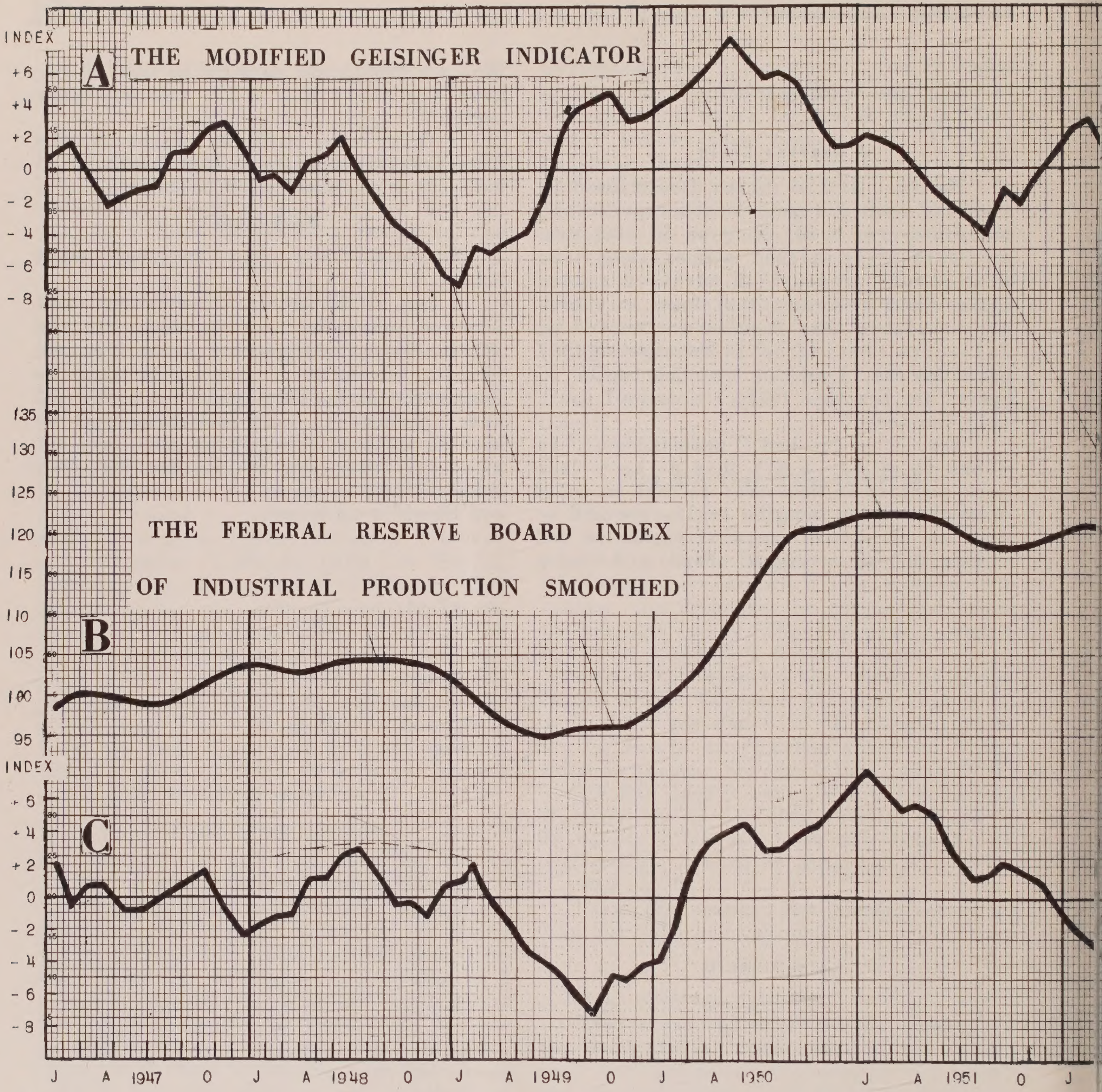
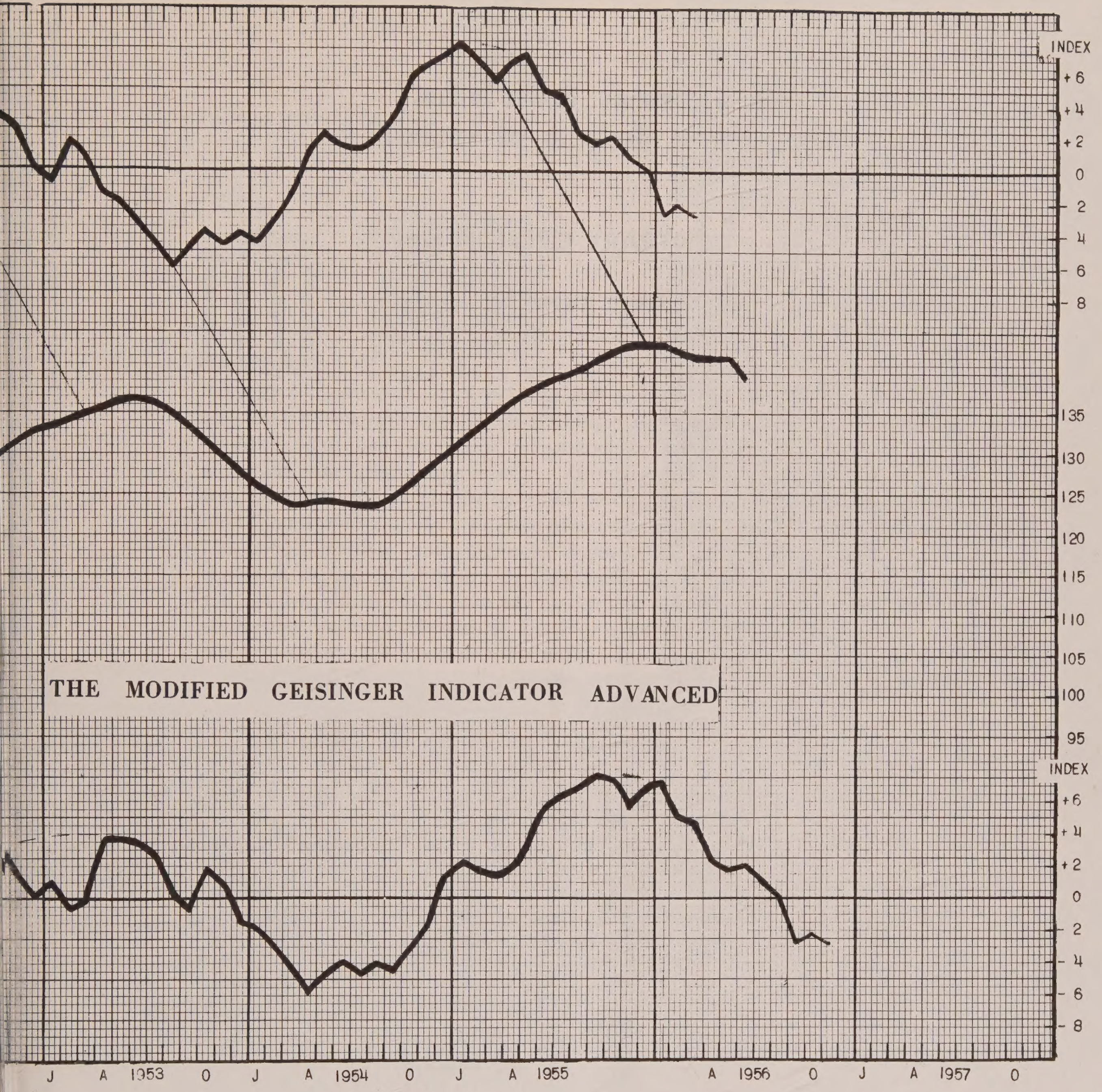


Fig. 1 Curve A. The Modified Geisinger Industrial Production Indicator Curve. This curve is derived from certain figures which are published monthly in the *Survey of Current Business*. It tends to turn about 8 months before the Federal Reserve Board Index of Industrial Production.

Curve B. The Federal Reserve Board Index of Industrial Production adjusted for seasonal variation and smoothed by a 3-month moving average. The value for the latest available month is shown by a dot.

Curve C. This curve is the Modified Geisinger Industrial Production Indicator Curve advanced by 8 months. This process projects part of the curve into the future. If the relationships of the past continue, the projection gives some hint of what may happen to the Federal Reserve Board Index of Industrial Production (Curve B).

OF INDUSTRIAL PRODUCTION



THE FORECAST

Since I wrote you last, the preliminary figure of the Federal Reserve Board Index of Industrial Production for June has become available. It is 141. This makes the average for the first half of the year 142.17. Last February my guess for the 1st half of 1956 was 142. I hope my February guess for the 2nd half of 1956 (135) is as good, but it isn't likely to be. A bull's eye 10 months in advance and twice in succession is too much to hope for.

The Modified Geisinger Indicator of Industrial Production for March 1956, (November 1956 when projected) is -2.84, down a trifle from the value of -2.10 for February 1956 (October 1956 when projected.)

From the figures already in I can tell that the Indicator will rise for April 1956 (December 1956 when projected) but I cannot yet tell how much. It rather looks as if it were bottoming out for next fall, doesn't it? Of course no one knows for sure, but I think that I'd be wise to raise last February's guess for 2nd half 1956 from 135 to 137, which I hereby do.

July 30, 1956 *E.R.D.*

Mr. H. A. Musham
741 No. Rush St.
Chicago, Ill.

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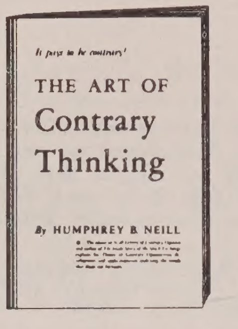

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